Article details: 2013-0080	
Title	**Retrospective analysis of patient and hospital factors associated with route of hysterectomy for women with benign uterine disease in the Vancouver Coastal and Providence healthcare regions**
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Reviewer 1	**Guylaine Lefebvre**
Institution	University of Toronto, Department of Obstetrics and Gynaecology
General comments	A refreshing perspective on the factors linked to MIS hysterectomy. A few comments that could enhance communication of your findings: - Number of hysterectomies give this study appropriate power to look at variables. - Evidence has already demonstrated that surgeon-specific factors are highly linked to approach. Please specify why you chose to look at Hospital vs surgeon data. - Why did you choose to look at rural and socio-economic factors? Is there a hypothesis to start that those factors are influencing decision to treat/approach? I suspect the later is linked to other patient characteristics which you briefly allude to and the former may be linked to the surgeons practicing at that site. So rural becomes a system issue and socioeconomic linked to a series of non-controlled patient characteristics. - line 41 and 177 contradict each other. It is credible that vaginal hyst is more common when vaginal prolapse procedures are necessary and this is demonstrated by your numbers. - lines 215-218 use multivariate analysis to try and explain the reduction in vaginal hysterectomy is not completely credible. Suggest admitting that the vag hyst rate has declined and offer then a possible explanation linked to the varying patient characteristics that may contribute to the decline. The concept of technicity is independent of patient characteristics and to be true to the question the reality is in crude numbers here. - lines 157 and 177 describe the findings that rural location is associated with laparoscopy yet in line 211 -213 you point out that rural hospitals need education in laparoscopic hyst?? 1000 laparoscopic hysts done in rural hosp with the MIS rate in urban hospitals is 1979/4164 which is not stats sign than your overall rate at 47.5%?
Reviewer 2	**Philippe Laberge**
Institution	None listed.
General comments	Very interesting and instructive review. However page 6 it is a bit challenging to figure out; which technique is compared to which when addressing specific factors and which factor is in favors which technique; in the two paragraphs describing results on p.6, what can we conclude about the patient with prolapse? Prolapse was more often treated by laparoscopy vs abdominal? or what about concomitant salpingectomy? results seem to disfavor laparoscopy for concomitant procedure yet you mention rightfully so that prophylactic salpingectomy favors laparoscopy in your discussion... Maybe a table would help summarize to the reader's benefit?
Author response	We thank the editors and reviewers for the thoughtful and constructive comments and suggestions. Please find our responses to the comments with the comment, author response, and modified text. Reviewers' Comments to Author: Reviewer: Dr. Guylaine Lefebvre, University of Toronto, Department of Obstetrics and Gynaecology A refreshing perspective on the factors linked to MIS hysterectomy. A few comments that could enhance communication of your findings: 1. Number of hysterectomies gives this study appropriate power to look at variables. This suggestion has been incorporated into the strengths and limitations section: ". . . the use of the DAD as the core population-based dataset (that includes multiple hospitals within a defined geographical area, urban and rural locations, and ensures an adequate study size) is a major strength of this study." 2. Evidence has already demonstrated that surgeon-specific factors are highly linked to approach. Please specify why you chose to look at Hospital vs surgeon data.

	Surgeon data was not available in the dataset, and this has been included as a potential limitation in the revised manuscript. As well, adjustment for hospital and patients characteristics indicate that the significant temporal trend in routes of hysterectomy is likely a result of changing surgeon skill and/or attitude towards the route of hysterectomy, as opposed to changes in patient or hospital characteristics. 3. Why did you choose to look at rural and socio-economic factors? Is there a hypothesis to start that those factors are influencing decision to treat/approach? I suspect the latter is linked to other patient characteristics which you briefly allude to and the former may be linked to the surgeons practicing at that site. So rural becomes a system issue and socioeconomic linked to a series of non-controlled patient characteristics. In our discussion, we make reference to the association between association between rates and routes of hysterectomy and socioeconomic status, race, and geographic location has been previously documented in the literature. However, it was unclear if this association was present in a Canadian setting, and we planned part of our analysis to address this question. The wording of our hypotheses have been modified to reflect this: "As patient choice and surgeon factor may influence route of hysterectomy, we also hypothesized that in addition to clinical factors such as presence of fibroids and endometriosis, patient sociodemographic factors and hospital and geographic setting would also be associated with route of hysterectomy." 4. Line 41 and 177 contradict each other. It is credible that vaginal hyst is more common when vaginal prolapse procedures are necessary and this is demonstrated by your numbers. This was an error in the abstract, and the abstract has been modified accordingly. 5. Lines 215-218 use multivariate analysis to try and explain the reduction in vaginal hysterectomy is not completely credible. Suggest admitting that the vag hyst rate has declined and offer then a possible explanation linked to the varying patient characteristics that may contribute to the decline. The concept of ethnicity is independent of patient characteristics and to be true to the question the reality is in crude numbers here. The interpretation of the data has been rewritten to reflect these observations: "In this study, we observed an overall decline in vaginal hysterectomies. One potential reason for the temporal decline in crude rates may be changes in patient characteristics over time. For example, it is possible that women with structurally normal uteri who would have been candidates for vaginal hysterectomy increasingly benefitted from effective conservative treatments for menstrual bleeding disorders – such as hormonal or ablative therapies – and were less likely to require hysterectomy. This is consistent with the observation that fibroids represented the most common indication for hysterectomy, and the multivariate analysis which showed that the odds of vaginal hysterectomy increased significantly over the study period by 12% per year (95% CI 1%-22%) compared with abdominal hysterectomy when patient characteristics were controlled." 6. Lines 157 and 177 describe the findings that rural location is associated with laparoscopy yet in line 211 -213 you point out that rural hospitals need education in laparoscopic hyst?? 1000 laparoscopic hysts done in rural hosp with the MIS rate in urban hospitals is 1979/4164 which is not stats sign than your overall rate at 47.5%? We agree with the reviewer that definitive conclusions cannot be drawn about the rural hospital setting, as the vast majority of hysterectomies in the dataset were performed in urban areas. We have therefore revised the Discussion section to exclude the suggestion for more education in rural hospitals. Of interest, only 217 (4.96%) of hysterectomies in our study were performed in rural hospitals, while approximately 10% of vaginal hysterectomies were performed in rural hospitals, and the difference in proportions is statistically significant. This significant association does not persist after adjustment, suggesting that the relatively higher proportion of vaginal hysterectomies in rural hospitals is due to differences in patient

	characteristics. Reviewer: Dr. Philippe Laberge Very interesting and instructive review. 1. Page 6 it is a bit challenging to figure out; which technique is compared to which when addressing specific factors and which factor is in favors which technique; in the two paragraphs describing results on p.6, what can we conclude about the patient with prolapse? Prolapse was more often treated by laparoscopy vs abdominal? or what about concomitant salpingectomy? Results seem to disfavor laparoscopy for concomitant procedure yet you mention rightfully so that prophylactic salpingectomy favors laparoscopy in your discussion... Maybe a table would help summarize to the reader's benefit? We agree with the reviewer that there are multiple comparisons made between multiple routes of hysterectomy, and there are again differences seen between crude rates and adjusted rates. We have included the subheadings "Study sample", "Unadjusted results", "Adjusted results", "Operative outcomes," as well as subheadings for the routes being compared to help clarify the different analyses being performed. We have included a paragraph discussing our findings related to prolapse indication and prolapsed procedure: "We also found the seemingly contradictory result that a concurrent procedure was associated with both the abdominal (versus laparoscopic) route and the vaginal (versus abdominal) route. These findings can be explained by the fact that while the vast majority of women with prolapse underwent vaginal hysterectomy with a concurrent prolapse procedure, there was a subset of women undergoing a concurrent prolapse procedure (e.g., hysterectomy and concurrent colposacropexy) who did not have vaginal surgery. In such cases, the hysterectomy and the concurrent procedure were performed by the abdominal rather than the laparoscopic route."